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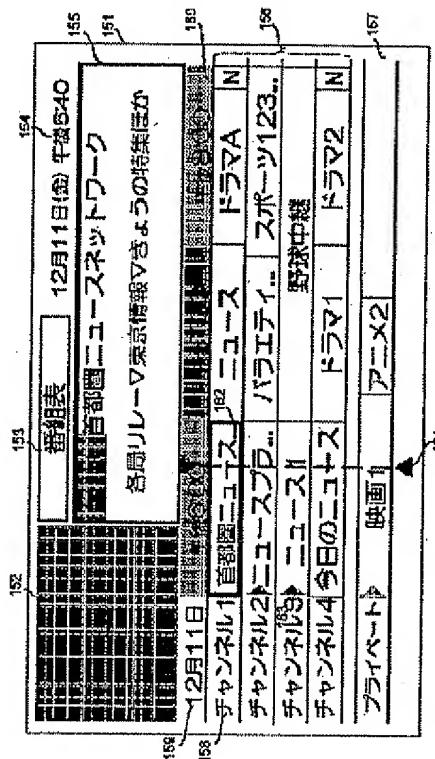
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TITLE : DEVICE AND METHOD OF  
BROADCAST PROGRAM RECORDING  
AND REPRODUCTION AND  
COMPUTER-READABLE RECORDING  
MEDIUM RECORDING COMPUTER  
PROGRAM FOR RECORDING AND  
REPRODUCING BROADCAST  
PROGRAM



cited Ref. for EP 1615.04 EP

ABSTRACT : PROBLEM TO BE SOLVED: To obtain a broadcast program recording device that is provided with an electronic program guide that displays and operates broadcast programs and recorded programs without distinguishing them by allowing the electronic program guide to handle a private channel consisting of recorded programs as one channel in addition to broadcast channels.

SOLUTION: A private channel line 157 consisting of recorded programs and recording reservation programs is displayed on a program guide menu 151 in addition to a broadcast program guide 156. The recorded programs of the private channel are arranged in the order of recording date and time. In the private channel, the time position of a recorded program which was reproduced lastly is stored in cross-reference with a current position and displayed by matching this position with a current time line 161 on the broadcast program guide 156. A user uses a program selection cursor 162 to select broadcast programs and recorded programs without distinguishing them so as to attain operations such as viewing, reproduction and recording reservation.

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## Notes:

1. Untranslatable words are replaced with asterisks (\*\*\*\*).
2. Texts in the figures are not translated and shown as it is.

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## CLAIMS

## [Claim(s)]

- [Claim 1] Operation of viewing and listening of this program or record reservation is possible by displaying the list of the programs broadcast by each broadcast channel, and choosing this displayed list. Program record playback equipment characterized by what the program recorded by this record reservation is likened with an imagination channel, and is displayed in addition to said list.
- [Claim 2] Operation of viewing and listening of this program or record reservation is possible by displaying the list of the programs broadcast by each broadcast channel, and choosing this displayed list. Program record playback equipment characterized by what the program of the schedule recorded by this record reservation is likened with an imagination channel, and is displayed in addition to said list.
- [Claim 3] Program record playback equipment according to claim 1 or 2 characterized by arranging in when generating said imagination channel the program contained in this imagination channel in order of record time.
- [Claim 4] Claim 1 characterized by classifying and arranging having viewed and existing listened or viewing and un-listening in when holding the reproduction history of said program and generating said imagination channel based on said reproduction history of each program - program record playback equipment given in any 1 clause of three.
- [Claim 5] The record program and the time position when ending reproduction of this program are held. Claim 1 characterized by uniting said time position of said record program at the time of the last end of reproduction in the imagination channel with the present time in the list display of said broadcast channel when displaying said imagination channel - program record playback equipment given in any 1 clause of four.
- [Claim 6] By referring to a program information management means to extract and manage the program information about the program broadcast by each broadcast channel, and said program information management means By referring to a record program information management means to record and manage the program information on the already recorded program or the program which made record reservation, and said program information management means While extracting the program information about said program and creating and displaying the program guide based on this program information The imagination channel which consists of program information on the program already recorded by referring to said record program information management means or the program which made record reservation is generated. Program record playback equipment characterized by having a program guide display means to add and display said imagination channel on said created program guide, and being constituted.
- [Claim 7] Program record playback equipment according to claim 6 characterized by operation of viewing and listening of a program or operation of record reservation, reproduction of a record program, etc. being possible from the created program guide.
- [Claim 8] Said program guide display means is program record playback equipment according to claim 6 or 7 characterized by arranging the program information on the recorded program or the program which made record reservation in when generating an imagination channel in order of the record time.
- [Claim 9] Memorize said record program information management means, and the reproduction history about each record program [ said program guide display means ] Claim 6 characterized by each record program classifying and indicating having viewed and existing listened or viewing and un-listening based on the reproduction history which said record program information management means has memorized when generating an imagination channel - program record playback equipment given in any 1 clause of eight.
- [Claim 10] Memorize said record program information management means, and the record program and its time position when ending reproduction last time [ said program guide display means ] When displaying the imagination channel which consists of said record program information by referring to said record program information management means Claim 6 characterized by uniting the time position of said record program at

the time of the end of reproduction with the present time in said program-guide display last time in the imagination channel - program record playback equipment given in any 1 clause of nine.

[Claim 11] Operation of viewing and listening of this program or record reservation is possible by displaying the list of the programs broadcast by each broadcast channel, and choosing this displayed list. The program record reproduction method characterized by what the program of the schedule recorded by the program recorded by this record reservation and this record reservation is likened with an imagination channel, and is displayed in addition to said list.

[Claim 12] The program record reproduction method according to claim 11 characterized by arranging in when generating said imagination channel the program contained in this imagination channel in order of record time.

[Claim 13] The program record reproduction method according to claim 11 or 12 characterized by classifying and arranging having viewed and existing listened or viewing and un-listening in when holding the reproduction history of said program and generating said imagination channel based on said reproduction history of each program.

[Claim 14] The record program and the time position when ending reproduction of this program are held. Claim 11 characterized by uniting said time position of said record program at the time of the last end of reproduction in the imagination channel with the present time in the list display of said broadcast channel when displaying said imagination channel - the program record reproduction method given in any 1 clause of 13.

[Claim 15] The program information management function to extract the program information about the program broadcast by each broadcast channel from a broadcast wave to a computer, and to manage it to it, and by referring to said program information management means The record program information management function to record and manage the program information on the already recorded program or the program which made record reservation, and by referring to said program information management means While extracting the program information about said program and creating and displaying the program guide based on this program information The imagination channel which consists of program information on the program already recorded by referring to said record program information management means or the program which made record reservation is generated. The recording medium which recorded the program record reproduction program for realizing the program guide display function which adds and displays said imagination channel on said created program guide and in which computer reading is possible.

## DETAILED DESCRIPTION

[Detailed Description of the Invention].

[0001]

[Field of the Invention] This invention relates to the recording medium which recorded the program record playback equipment, method, and program record reproduction program which record the Television Sub-Division program and can be reproduced and in which computer reading is possible. In the electronic program guide which makes program selection and record reservation easy by showing a user the information about the time of a program, or a program especially Not only a program but the information on the program stored in the recording medium or the program of the schedule stored in a recording medium from now on is related with the recording medium which recorded the program record playback equipment which can display fair and can be operated, the method, and the program record reproduction program and in which computer reading is possible.

[0002]

[Description of the Prior Art] The broadcast of the program in which digital compression was carried out by development of digital image audio compression technology, such as MPEG, and development of digital broadcasting technology in the television broadcasting by the satellite or a terrestrial wave is considered, and the part is put in practical use in CS broadcasting in recent years. In this digital broadcasting, it is possible to transmit not only a program image sound but arbitrary digital information. Program information, including under broadcast, the start time of the program of a broadcast schedule, contents explanation, etc., is transmitted as that one application, and the electronic program guide (EPG) to which a user can perform program selection, record reservation, etc. using this information is put in practical use.

[0003] [ with the improvement in performance of a storage which is represented by hard disk drive and in which random access is possible ] on the other hand The program record playback equipment which can carry out record accumulation of the digital compression image of tens of [ several to ] hours of Television Sub-Division programs, such as a terrestrial wave and satellite broadcasting, at a mass recording medium,

and can be reproduced is being put to practical use, and, generally it is also called the home server. This home server is expected as post VTR (videotape recorder) in the above-mentioned digital broadcasting age, and in order that a user may operate a home server, it is considered that an electronic program guide becomes important.

[0004]

[Problem to be solved by the invention] However, the conventional electronic program guide has the problem that it cannot use in operation of a record program only in consideration of a program.

[0005] [ the information on record reservation what kind of program is recorded in what kind of order with the conventional VTR about operation of a record program / memorizing to the necessary field of videotape ]

There is a function in which a user can discover a desired record program easily, and, generally this function is called the navigation function and the library function. However, these functions are functions which the electronic program guide completely became independent of, and the feeling of operation and operation system differ from them of the electronic program guide. Therefore, it is expected that only the operation system which is not user-friendly for a user can be offered only by unifying an electronic program guide and a navigation function simply.

[0006] Moreover, in order to solve this problem, the technology indicated to JP,H10-42242,A is known as technology aiming at obtaining a user-friendly electronic program guide. This technology chooses whether a user displays / operates first either a program or the record program recorded on the recording medium (channel navigate/tape navigate). Then, although he is trying to deal with one of a program and the record programs in fixed display/operation format, it is necessary to choose whether he wants to watch a record program for a user wanting whether to watch a program after all, and only the operation system which is not user-friendly for a user can be offered.

[0007] This invention is made in view of the above problem, and extends a display and operation system of the conventional electronic program guide. It aims at offering the recording medium which recorded program record playback equipment, a method, and a program record reproduction program equipped with the electronic program guide which displays a program and a record program fair and can operate them and in which computer reading is possible.

[0008]

[Means for solving problem] A program information management means for the program record playback equipment of this invention to extract program information from a broadcast wave, and to manage, A \*\*\*\*\* program information management means to record and manage a recorded program and a record reservation program with the program information, and the program guide based on said program information and said record program information were displayed, and it decided to have the program guide display means which enables operation of program selection, reservation, etc. by a user.

[0009] And the imagination channel which consists of said record program information was generated, said program guide display means likened it with one channel in said program information, and it was displayed similarly and it made it the broadcast channel as [ be / operational ].

[0010] Furthermore, said program guide display means memorizes the record program and its time position when ending reproduction last time. When displaying the aforementioned imagination channel, said time position of said record program at the time of the end of reproduction was made to unite with the present time in a broadcast channel display last time in the imagination channel.

[0011]

[Mode for carrying out the invention] The form of operation of this invention is explained using Drawings below.

[0012] Drawing 1 shows an example of hardware composition which realizes the program record playback equipment corresponding to the digital broadcasting wave in the form of operation of this invention. In this figure, a solid line shows the flow of data and the dashed line mainly shows the flow of control.

[0013] The broadcast data received from the broadcast wave received with antennas, such as a satellite wave and a terrestrial wave, and wired networks, such as a cable, (--- the information \*\*\*\*\* (ed) in a satellite wave, a terrestrial wave, a cable, etc. is hereafter called a broadcast wave.) --- it tunes in to the channel which was supplied to the tuner 101 and controlled by the system controller 109. Since information is generally multiplexed, the digital signal of the tuned-in channel is divided into elements, such as program image voice data and EPG information, by demulti pre Kusa 102. [ the program image voice data by which digital compression was carried out among this separated information ] At the time of program viewing and listening, are directly sent to a selector 105, and the data storage 104 is supplied by control of the system controller 109 at the time of program record, and it is accumulated. Furthermore, at the time of program reproduction, program image voice data is read from the data storage 104 by control of the system controller

109, and it is sent to a selector 105. Although it is possible that the data storage 104 is constituted using an optical disk unit, optical-magnetic disc equipment, etc. which are represented by the magnetic disk drive represented by the hard disk and DVD, you may constitute using storage means other than these. The program image voice data obtained from the selector 105 is decoded by an image and the sound using the digital decoder 106, and is further superimposed about an image with the EPG display operation screen which the system controller 109 controls by OSD(once clean display)107.

[0014] Moreover, the EPG information separated in demulti pre Kusa 102 is sent to the EPG Management Department 103, and is displayed / operated by the system controller 109 in the cases, such as a user's program selection and record reservation. In addition, operation of a user is told to the system controller 109 from the final controlling element 108, which consists of an operation key in the whole surface panel of this equipment, and a remote controller.

[0015] The microcomputer with which the system controller 109 makes the core of a software processing capability, The random access memory holding a program or data, and a read-only memory, It consists of real-time clocks which maintain the present time for the I/O controller for controlling peripheral equipment, record time of day control, etc. Each hardware of program record playback equipment is controlled as mentioned above, and processing of record reproduction operation of a program, a user's record reservation, viewing-and-listening program selection, etc. is realized.

[0016] In addition, although the example of hardware composition of the program record playback equipment explained until now was an example for the digital broadcasting by which image voice data and EPG information were multiplexed For example, you may be aimed at the broadcast [ like ] inserted in the perpendicular synchronous retrace line period (VBI) by EPG information in an analog terrestrial wave. What is necessary is just to have composition which adds the encoder which carries out [ sound / analog image ] digital compression as an example of composition in this case to the latter part of a tuner 101, adds the equipment which decodes the EPG information on VBI, and inputs EPG information into the EPG Management Department 103.

[0017] Next, an example of button arrangement (only portion required of explanation of operation by this example) of the remote controller which is an example of the final controlling element 108 of the program record playback equipment in the form of this operation is shown in drawing 2 , and the function of each button is explained with the outline in the mode of acting-before-the-audience group record playback equipment of operation.

[0018] The program record playback equipment in the form of this operation consists of four modes of operation which are divided roughly and enumerated below. In addition, in acting-before-the-audience group record playback equipment, the function of a private channel is characteristic, and a recorded program and a record reservation program are put in order, and in the program-guide mode mentioned later, this is likened with a channel and displayed with a broadcast channel.

[0019] Broadcast viewing-and-listening mode: It is a mode for viewing and listening to the program broadcast now [ of the channel tuned in by the tuner 101 ]. In this mode, a tuning channel can be changed with channel rise / down button (not shown), a ten key button (not shown), etc.

[0020] Program-guide mode: Based on the EPG information of the EPG Management Department 103, display the program about the program of the inside of the present broadcast, or a broadcast schedule on a tabular format, further, also combine the information on a private channel with said program table, and display it. The recorded program and the record reservation program are put in order by the private channel, and they are displayed / operated in the same form as the program guide of a broadcast channel in one channel called a private channel in program-guide mode. It shifts to this mode in \*\*\*\*\* which pushes the program-guide button 121, and the cursor which chooses a program by the bottom of \*\* of each vertical and horizontal button 124,125,126,127 is operated. Moreover, the bottom of \*\* of the determination button 128, the play button 129, or the record button 134 performs viewing and listening of a program, reproduction of a record program, and record reservation.

[0021] Private channel list mode: Display the list of those programs based on the information on the recorded program which the system controller 109 manages, or a record reservation program. It shifts to this mode in \*\*\*\*\* which pushes the private channel button 122, and the cursor which chooses the program in a private channel by the bottom of \*\* of each vertical and horizontal button 124,125,126,127 is operated. Moreover, the recorded program chosen by the bottom of \*\* of the determination button 128 or the play button 129 is reproduced.

[0022] Reproduction viewing-and-listening mode: It is a mode for reproducing, viewing and listening to the recorded program accumulated in the data storage 104. In this mode, it rewinds, special reproduction according to it is performed by the bottom of \*\* of the play button 131, the fast forward play button 132, or

the pause button 133, and a program image is overlapped on the information. In the program reproduced by the bottom of \*\* of the information button 123 now. Moreover, reproduction of a recorded program is ended by the bottom of \*\* of the stop button 130.

[0023] Next, the screen composition in the program-guide mode of the program record playback equipment in the form of operation of this invention is explained using drawing 3. In this mode, a program and a record program can be chosen fair, and it can view and listen to them. The program-guide screens 151 are constituent factors with the main private channel line 157 which displays the private channel with which the program table 156 and the recorded program which are the program guide of each broadcast channel, and the record reservation program were compared. It consists of program information display parts 155 which display the contents of the small screen image part 152 which displays the small screen image of a selection program, on others, the mode title 153 which shows the present mode, the present time display part 154, and the selection program etc.

[0024] In the program table 156, the program of the inside of broadcast or a broadcast schedule is shown by the tabular format as a cell according to a start and finish time of the program at the time specified about each broadcast channel based on the EPG information which the EPG Management Department 103 holds. The title of the program is displayed on a program cell. In this example, the horizontal axis of the program table 156 is time, and a vertical axis corresponds to a channel. In drawing 3, the date of a program guide is December 11 as displayed on the date display part 159, and the program of each channel up to 8:00 sets is displayed on this program guide from 6:00 sets in the afternoon on the afternoon of December 11. It is shown that the program of the title which the broadcast channel line 158 of the first line is displayed as "metropolitan area news ..." from 6:00 p.m. to 7:00 p.m., and starts by "metropolitan area news" is broadcast. When a program title has not entered, he omits a title name and is trying to add "..." here so that it may be settled.

[0025] Furthermore, when the present time is contained in the display rectangle in the program table 156, the present time line 161 showing the present time is displayed, and it turns out that the program which has overlapped with this line is a program broadcast now. Moreover, when a program straddles the display rectangle of a program guide, the continuous mark 163 is displayed before and after the program cell.

[0026] As the recorded program and record reservation program of a private channel unite the private channel line 157 with the time length (unit) of the length (record time) program table of the program, it is put in order and displayed on the program queue order in a private channel. The contents of the cell are the titles of the recorded program of a private channel, or a record reservation program like the program table 156.

[0027] In order to choose each program of the program table 156 and the private channel 157 and to operate [reservation / viewing and listening,] it, the program selection cursor 162 to show surrounding the circumference of a program cell and being chosen is displayed. The program selection cursor 162 is operated by the user through a final controlling element 108.

[0028] The concept of the overall method of presentation of the program table 156 and the private channel line 157 is explained using drawing 7. In drawing 7, 201 shows the example of a display of the program table 156 in program-guide mode, and the private channel line 157. Among these, the selection range portion 202 which contains the program selection cursor 162 of the program table whole [203] as shown in the right of drawing 7 is displayed on the program table 156. Furthermore, the position of the selection range 202 in the program table whole [203] changes with operations of the program selection cursor 162.

[0029] [as shown in the lower part (ChP) of drawing 7, the recorded program and the record reservation program are located in a line with the private channel 204, but] on the other hand Since those programs are not real time broadcasts, when combining with the program table 156 as a private channel line 157 and displaying, you have to perform matching with the time of a program. Then, as shown in drawing 7, in this example, the private channel 204 is caught with one imagination tape on which a recorded program and a record reservation program are located in a line in order of record time. Only the one present position 205 of the tape is decided, and as it unites, it displays on the present time line 161 in the present position and program table. In the example of drawing 3, the present position is in one point of the program of the title "a movie 1", and this is displayed according to the present time line 161. however -- since a program is broadcast as for a record reservation program (since record is started) -- \*\*\*\* -- since it cannot view and listen, the determination method of the cell display position of a record reservation program differs from it of the recorded program. About this, it mentions later.

[0030] In this example, the present position of a private channel is the end position of reproduction of the recorded program in the private channel which finally ended reproduction. This can be caught the same with the tape position which carried out the end of playback in VTR being held, and is easier to understand a user.

[0031] Moreover, although the program table 156 and the private channel line 157 have dissociated like drawing 7 in this example. The private channel 204 exists in the topmost part or the lowermost part of the program table whole [ 203 ], and how to make unite a private channel as one of the broadcast channels, and display it is also considered. In this case, like a broadcast channel, only when the private channel 204 is contained in the selection range, it is displayed on a program-guide screen.

[0032] Next, focusing on operation of the program selection cursor 162, operation in the program-guide mode in the form of operation of the 1st of this invention is explained using the flow chart shown in drawing 10. If it shifts to program-guide mode from other modes by the bottom of \*\* of the program-guide button 121, processing will progress according to the flow chart of drawing 10. At Step S101, the channel and time zone which are displayed as an initial screen of a program guide are determined first. Here, when it has shifted from broadcast viewing-and-listening mode, as the program selection cursor 162 is in the program to which it was viewing and listening, the selection range 202 of drawing 7 is chosen. Moreover, when it has shifted from private channel list mode or reproduction viewing-and-listening mode, as the program selection cursor 162 is in a recorded program with the present position of a private channel, the selection range 202 is chosen. It expresses as a form which explained the program table 156 and the private channel line 157 at Steps S102 and S103 until now. The program selection cursor 162 is expressed as Step S104, and program information, including the contents of the program with cursor etc., is displayed on the program information display part 155. If it is the program which the program which furthermore has cursor by S105 is broadcasting, the channel will be tuned in, and if it is a recorded program, the program will be reproduced, the image is displayed on the small screen image part 152, and the sound of the program is also outputted.

[0033] Next, the input of a final controlling element 108 is received at Step S106, and it processes according to the bottom of \*\* of an input button. When each button of the upper button 124, the bottom button 125, the left button 126, and the right button 127 is pushed (S107), the program selection cursor 162 is moved in the direction which the button means. In addition, since it is the image that the private channel line 204 is located in the bottom of the program table whole [ 203 ] like [ in this example ] drawing 7, The program selection cursor 162 is in the broadcast channel of the lowest line, and if the bottom button 125 is pushed further, the program selection cursor 162 will move to the private channel line 157. Moreover, if the upper button 124 is pushed when the program selection cursor 162 is in the private channel line 157 conversely, the program selection cursor 162 will move to the broadcast channel of the lowest line.

[0034] When the recording button 134 is pushed (S108), processing according to the kind of program with the program selection cursor 162 is performed. The contents of processing are shown in Table 1, if the program which cursor points out is broadcasting, record of the program will be started, and if it is a program non-broadcast (future broadcast schedule), the record reservation will be performed. The program information on the program managed with record of the image sound of a program at the EPG Management Department 103 is also simultaneously recorded at the time of program record. A private channel is constituted based on this program information.

[0035] When the cancellation button 135 is pushed (S109), if the program selection cursor 162 has pointed out the record reservation program as shown in Table 1, the record reservation will be canceled, and nothing will be done if except [ its ] is pointed out.

[0036] When the play button 129 is pushed (S110), as it is shown in Table 1, only when the program selection cursor 162 has pointed out the recorded program. The program is reproduced from the end position of reproduction (after-mentioned), and if the other program is pointed out, it will reproduce from a time [ for the present position to point out the recorded program in the present position of a private channel ] position. Reproduction is performed in reproduction viewing-and-listening mode (S112).

[0037] When the determination button 128 is pushed (S111), if it is the program which the program selection cursor 162 is broadcasting as shown in Table 1, it will shift to the broadcast viewing-and-listening mode which views and listens to the program, and if it is a recorded program, reproduction will be performed from the end line of reproduction of the program (after-mentioned), and it will shift to reproduction viewing-and-listening mode (S113).

[0038] When the program-guide button 121 is pushed (S114), the front mode in the present program-guide mode is searched except for private channel list mode and program-guide mode, and if a front mode is broadcast viewing-and-listening mode, if it is in reproduction viewing-and-listening mode, it returns to broadcast viewing-and-listening mode at reproduction viewing-and-listening mode.

[0039] When the private channel button 122 is pushed (S115), it shifts to private channel list mode.

[0040] Next, the example of a screen in operation in program-guide mode is concretely explained using Drawings. Drawing 4 shows the screen in program-guide mode when record reservation is performed. In this figure, the program selection cursor 162 has pointed out the "drama A" which begins from 8:00 p.m. of the

broadcast channel line 158, and it is the state where pushed the recording button 134 and record reservation was performed. According to the position of cursor, the contents of "the drama A" are displayed on a program information display part, and since the small screen image part 152 is a broadcast schedule program, it is not displayed at all.

[0041] While the record reservation mark 164 is displayed on the program cell in which record reservation was performed, the contents of reservation are displayed also on the private channel line 157. In addition, on this screen, the sequence of the recorded program of a private channel is to "animation 2" by the position of a record position, and there is in the afternoon of the record reservation start time of "Drama A" before 8:00. Therefore, if the continuation sequence of a program cell is simply constituted in order of record time in a private channel, "Drama A" will be located immediately after the "animation 2" before record start time, and is unnatural. Then, the position of a record reservation program compares the position at the time of making it a continuation sequence, and the position of record reservation start time with the order of record time, and chooses to become a next position more. Since the direction of record reservation start time becomes behind in the "drama A" of drawing 4, it is displaying in the position.

[0042] Drawing 5 shows the state where the program selection cursor 162 was further moved to the right from the state of drawing 4. In this figure, cursor has pointed out the "news 9" which begins from 9:00 p.m., and 9:00 sets of portions are displayed in the afternoon that this portion serves as a display rectangle from 7:00 sets in the afternoon. Since the present time in this example is 6:40 p.m., the present time line 161 is not displayed, but the private channel line 157 to which the present position is joined as well as the program table 156 shifts to the present time line 161 compared with drawing 4, and it is displayed on it.

[0043] Drawing 6 moves the program selection cursor 162 downward from the state of drawing 4, and shows the state where the program of the private channel is pointed out. In this example, in order to catch a private channel in an image which is located in the bottom of the whole program table, the selection range 202 of drawing 7 is moving the lowest line of the program table 156 of drawing 6 until the lowest line channel "channel 4" of the whole program table is displayed. Moreover, the information about a recorded program "movie 1" with the program selection cursor 162 is displayed on the program information display part, and the reproduction picture of "a movie 1" is displayed on the small screen image 152.

[0044] Next, the screen composition in the private channel list mode of the program record playback equipment in the form of operation of this invention is concretely explained using drawing 8. In this mode, the list of the recorded program of a private channel or record reservation programs can be perused, and reproduction of a recorded program etc. can be performed. Drawing 8 shows the screen composition in private channel list mode, when it is the contents that program-guide mode is shown by drawing 3.

[0045] In drawing 8, the upper part of the private channel list screen 171 has the same composition as the upper part of the program-guide screen 151 of drawing 3. The table of the recorded program of a private channel and a record reservation program is displayed on the private channel table 176. In this example, each program is located in a line in order of record time. The private channel table 176 consists of each next field. that is, About each program, [ the record date of a program ] [ the record date display field 177 and record start time to display ] They are the record start time display field 178 to display, the record finish time display field 179 showing record finish time, the channel display field 180 which displays a channel, the title display field 181 which displays a title, and the rec/play situation display field 182 which shows the reproduction history of a program, and the state of record reservation. Furthermore, there are the program selection cursor 183 for choosing the program of the private channel table 171 and the present position mark 184 which points out a program with the present position of a private channel.

[0046] If the program is a recorded program and the reproduction history graph 185 is a record reservation program, the record reservation mark 164 ( drawing 9 ) will be displayed on the rec/play situation display field 182. The reproduction history graph 185 is graph which expressed visually the reproduction history how far the recorded program was reproduced and which position ended reproduction last time. The constituent factor of the reproduction history graph 185 is the end line 187 of reproduction which indicates the position ended last time to be the reproduced bar 186 showing the rate of the portion which set the whole program length (record time) to 1, and was reproduced also at once until now. For example, in the reproduction history graph 185 of the program of the 2nd line of the private channel table 176 of drawing 8, since it is ending with reproduction from the beginning of a program to [ from the length of the reproduced bar 186 ] about 75% of that, that is, program length is a little less than 3 hours, it turns out that it reproduced from the beginning to 2 hours and about 15 minutes. Moreover, since there is also an end line 187 of reproduction to about 75% from the beginning of a program, it turns out that the last reproduction was ended from the beginning in the position for 2 hours and about 15 minutes.

[0047] Moreover, the private channel list screen 171 of drawing 9 corresponds, when a program guide is in

the state of drawing 4. By having made record reservation of "the drama A" operation of the program-guide screen 151. Also in the private channel list screen 171 of drawing 9, "Drama A" is added to the last of the private channel table 176 according to the order of record time, and the record reservation mark 164 is displayed on the rec/play situation display field 182.

[0048] A position mark 184 is displayed now to the program in which the present position of a private channel exists. The present position of a private channel shows the position which ended reproduction last time by the whole private channel. That is, the present position mark 184 exists in the reproduction program when ending reproduction last time, and a position with the end line 187 of reproduction of the program serves as the present position of a private channel.

[0049] Next, the operation in private channel list mode is explained focusing on operation of the program selection cursor 183 using the flow chart of drawing 11. If it shifts to private channel list mode from other modes by the bottom of \*\* of the private channel button 122, processing will progress according to the flow chart of drawing 11. The recorded program and record reservation program in a private channel are first expressed as Step S121 as a private channel table 176. In this example, it arranges from a top to the bottom in order of record time. Moreover, the present position mark 184 is also displayed.

[0050] The program information which shows the contents of the program with the program selection cursor 183 and cursor etc. is expressed in the program information display part 175 as Step S122. The initial position of the program selection cursor 183 is a program which has a position mark 184 now. At Step S123, if a program with the program selection cursor 183 is a recorded program, while carrying out program reproduction and displaying the image on the small screen image part 172, a sound will also be outputted.

[0051] Next, a button input is detected at Step S124, and processing according to the pushed button is performed. When each button of the upper button 124, the bottom button 125, the left button 126, and the right button 127 is pushed, it moves in the direction in which the button means the program selection cursor 184 in Step S125, and returns to Step S121. When the play button 129 or the determination button 128 is pushed, if the program which has the selection cursor 184 in Step S126 is a recorded program, in order to reproduce the program, it shifts to reproduction viewing-and-listening mode (S127).

[0052] When the private channel button 122 is pushed, [ the front mode in the present private channel list mode ] It searches except for private channel list mode and program-guide mode, and if a front mode is broadcast viewing-and-listening mode, if it is in reproduction viewing-and-listening mode, it returns to broadcast viewing-and-listening mode at reproduction viewing-and-listening mode (S128). When the program-guide button 121 is pushed, it shifts to program-guide mode (S129).

[0053] Next, the reproduction viewing-and-listening mode in the form of operation of this invention is explained. Reproduction viewing-and-listening mode is a mode which reproduces a recorded program, and a program is displayed on the whole screen and it is reproduced. Operation in reproduction viewing-and-listening mode is explained using the flow chart of drawing 12. If it shifts to reproduction viewing-and-listening mode, processing will be performed according to the flow chart "reproduction viewing-and-listening mode" of drawing 12. The recorded program first specified at Step S131 is usually reproduced, and a display and an audio output are performed on the whole screen. At Step S132, a button input is detected and it processes according to the pushed button. If the rewind button 131, the fast forward button 132, and the pause button 133 are pushed (S132), it will rewind according to the button, reproduction, fast forward reproduction, and special reproduction of a stop will be performed, and it will return to Step (S133-135) S132.

[0054] A push on the information button 123 will output the information about the program reproduced now. Drawing 12 is the information example output, and the private channel information 201 which shows which hit in a private channel is reproduced here is outputted to the upper part of a screen. The same contents as the private channel line 157 in the program-guide screen 151 are displayed, and this information expresses the position which the present position line 202 is reproducing now. In addition, the position of the present position line 202 in the time of ending reproduction serves as the present position of the private channel in other modes.

[0055] If it returns to explanation of the flow chart of drawing 12 and the stop button 130, the program-guide button 121, or the private channel button 122 is pushed, reproduction will be stopped in Step S135. The reproduction history of the program which was being reproduced in Step S136 is updated, and it returns to broadcast viewing-and-listening mode, program-guide mode, or private channel list mode according to the pushed button (S137).

[0056] On the other hand, when it reproduces to the last of the program during program reproduction, processing of the flow chart "an end of a program" of drawing 12 is performed. The reproduction history of the program ended in Step S141 is updated, and it is investigated whether in Step S142, there is any next

recorded program of an end program. The following program is the following program in the row of a private channel, and means the following program in the order of record time by this example. When there is the following recorded program here, the program is reproduced in Step S143, and it returns to reproduction viewing-and-listening mode (S144). When there is no following recorded program, in Step S145, it shifts to broadcast viewing-and-listening mode.

[0057] With the form of the operation described above, although the record program in a private channel was arranged in order of record time, you may arrange using the reproduction history of a record program. That is, by a reproduction history, a record program is divided into having existing reproduced or un-reproducing, a reproduced program group is arranged in the upper part (left-hand side of the private channel of a program guide) of a private channel list, and a non-reproduced program group is arranged in the lower part. Furthermore, in order of what has last time old reproduction time, the inside of a reproduced program group is arranged in order of what has a non-reproduced program old [ record time ], and the present position of a private channel makes it the end position of reproduction of the program reproduced last time like the above-mentioned work example. If it carries out like this, the present position will exist in the program which touches the non-reproduced program group of a reproduced program group, and the program which already reproduced the left [ position / present ] also at once also in the program guide, and the program which has not seen the right [ program / of the present position / next ] yet will be located in a line. Since this agrees with a time-axis going to the right from the left also in a program guide intuitively, it is intelligible.

[0058] Moreover, with the form of the operation described above, although the number of private channels was one, it may have more than one. In this case, only one of two or more private channels is chosen by making a private channel line into two or more lines simply, for example, a genre, a user name, etc., and a form — it can be made to perform display and operation — can be considered.

[0059] Moreover, the program record playback equipment of this invention is set in the composition of the form of operation sake [ the form ] for example, described above carried out by computer. The computer program which performs the function described above to the computer is created. Record the computer program on the recording medium represented by CD-ROM, a floppy disk, and semiconductor memory, and [ the computer side ] If each above-mentioned function is generated to a computer by reading the recording medium with which this program was recorded, the function indicated in the form of operation of this invention can be built by computer. Moreover, the form currently recorded, for example on the recording equipment in a server is sufficient as this computer program, and the form offered through a network is sufficient as it.

[0060]

[Effect of the Invention] Since it can be operated fair like other broadcast channels as one channel with the form of operation of this invention by the private channel which consists of a recorded program and a record reservation program in a program guide A user can operate a record program efficiently and program record playback equipment with easy handling can be offered.

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[Translation done.]



本発明の実施の形態における番組記録再生  
 聴モードの画面構成例を示す説明図であ

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チプレクサ

管理部

ストレージ

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レデコーダ

ムコントローラ

ムコントローラ(一部)

ボタン

プライベートチャンネルボタン

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アン

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ボタン

157 プライベートチャンネル行

158 放送チャンネル行

159 日付表示部

160 列時刻表示部

161 現在時刻線

162 番組選択カーソル

163 継続マーク

171 プライベートチャンネル一覧画面

172 小画面映像部

173 モードタイトル

174 現在時刻表示部

175 番組情報表示部

176 プライベートチャンネル一覧表

177 記録日表示領域

178 記録開始時刻表示領域

179 記録終了時刻表示領域

180 チャンネル表示領域

181 タイトル表示領域

182 録再状況表示領域

183 番組選択カーソル

184 現在ポジションマーク

185 再生履歴グラフ

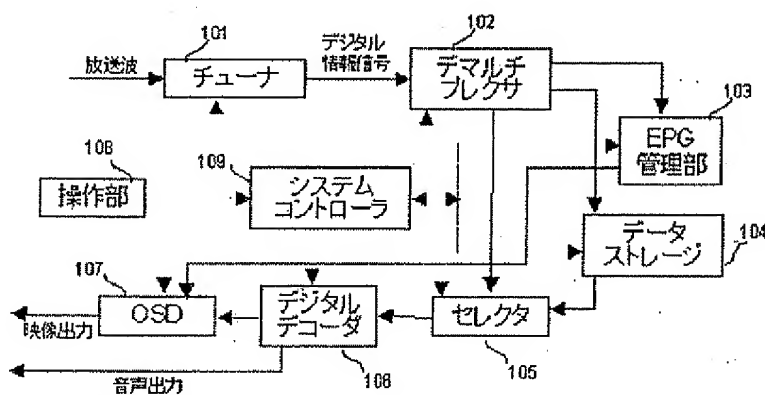
186 再生済みバー

187 再生終了線

201 プライベートチャンネル情報

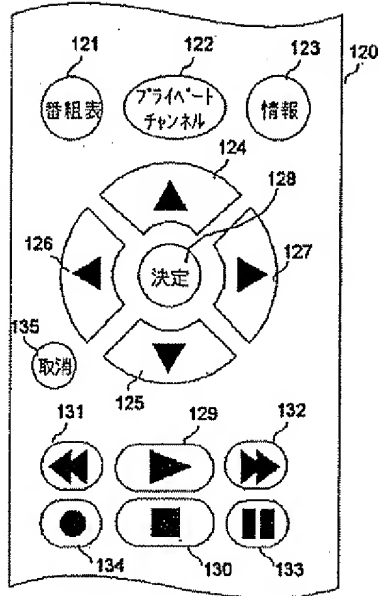
202 現在ポジション線

【図1】

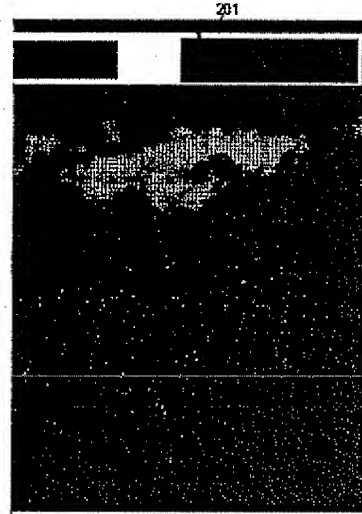




【図2】



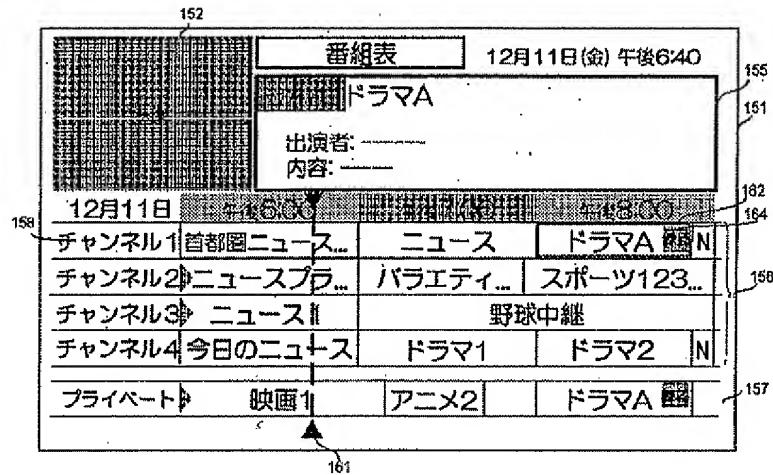
【図13】



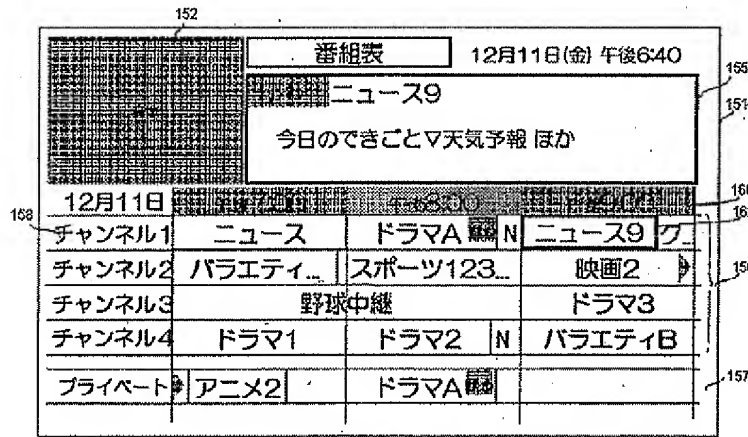
【図3】

番組表				12月11日(金) 午後6:40
首都圏ニュースネットワーク				各局リレーで東京情報▽きょうの特集ほか
12月11日	午後6:00	午後7:00	午後8:00	
チャンネル1	首都圏ニュース	ニュース	ドラマA	N
チャンネル2	ニュースプラ	バラエティ	スポーツ123	
チャンネル3	ニュースII	野球中継		
チャンネル4	今日のニュース	ドラマ1	ドラマ2	N
プライベート	映画1	アニメ2		

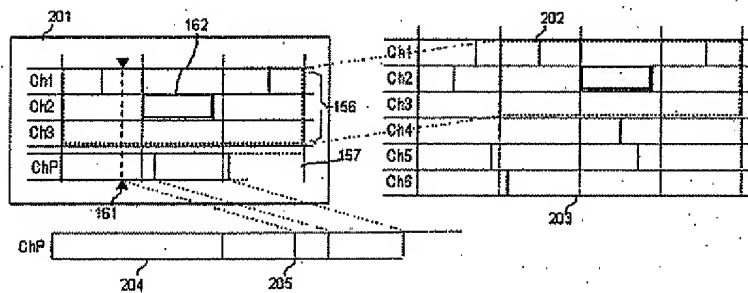
【図4】



【図5】



【図7】





【図11】

